

Remarks

The above amendments and these remarks are responsive to the Office Action mailed January 13, 2006. Applicants thank the Examiner for carefully considering the subject application.

Before discussing the Office action in detail, Applicants believe that it may be useful to review some background information. The present application is directed to reducing noise in an exhaust system of a vehicle. Specifically, the inventors herein have recognized that undesirable impingement noise may be generated by the exhaust gas pulses causing contact at the discontinuities, such as bends or tailpipe outlets.

Thus, the inventors herein have recognized that it possible to utilize a noise attenuation device upstream of the exhaust pipe outlet configured to reduce noise generated at the outlet. Specifically, claim 1 now recites:

A noise attenuation device for a vehicle exhaust system, comprising:
an exhaust pipe having a passageway for receiving exhaust gas pulses from an engine, said pipe having a discontinuity;
a plurality of vanes extending from an inner surface of said exhaust pipe and spaced apart from one another and disposed upstream of said discontinuity of said exhaust pipe and substantially proximate to said discontinuity, said vanes being oriented generally parallel to a direction of flow of said exhaust gas pulses and configured to reduce turbulence in said exhaust gas pulses flowing past said vanes to reduce noise generated at said exhaust pipe discontinuity; and
said passageway being substantially unobstructed in a proximity upstream of said vanes so that said flow is substantially unobstructed before impacting said vanes.

In this way, it is possible to utilize vanes upstream of the discontinuity to decrease noise. Specifically, by utilizing the unobstructed flow with upstream vanes, it is possible to reduce noise generated in a downstream discontinuity.

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Turning now to the cited art, Applicants respectfully submit that neither Nakase nor Kim show or suggest the above structure, nor can they achieve such advantageous results.

NAKASE, U.S. Patent 5,970,963

Applicants respectfully submit that Nakase et al. fails to disclose a passageway being substantially unobstructed in a proximity upstream of the vanes. Rather, Nakase et al. discloses an apparatus disposed downstream of and proximate to a throttle valve, thus the apparatus is at least partially obstructed by the throttle valve itself. In fact, the obstruction caused by the throttle valve is the very problem addressed by Nakase et al. As such, the rejection should be withdrawn. Similar arguments also apply to claim 13.

KIM, U.S. Patent 5,113,838

Applicants respectfully traverse the rejection of claims 1, 3, 5, 13, 16, 17 and 21 as anticipated by Kim. As discussed in the response to the Office action dated August 24, 2005, Kim does not disclose vanes oriented generally parallel to a direction of flow of said exhaust gas pulses. The Office action asserts that Fig. 3A of Kim shows the vanes being oriented generally parallel to a direction of flow of the exhaust gas pulses. Applicants respectfully disagree with this assertion. Fig. 3A of Kim (shown below) clearly shows the vane oriented at an angle to the direction of flow of air or exhaust gas.

FIG. 3A

Furthermore, Applicants have examined Kim and find no mention of vanes oriented generally parallel to the direction of flow. In fact, it is the angled vanes that enable the swirling air, hence each of the embodiments of Kim include vanes that are angled to the direction of air flow. For at least this reason, the rejection in view of Kim should be withdrawn. The above argument further applies to claim 13.

Rejections under 35 USC § 103

Applicants respectfully traverse the rejection of claims 2, 4, 8, 19 and 24 under 35 U.S.C. 103(a) as obvious over Nakase or Kim for at least the reason that neither Nakase or Kim, alone or in combination discloses or suggests all of the elements of any of these claims.

Further, as noted above, Kim it aimed at increasing turbulence, and gives no mention of how to reduce noise caused by a discontinuity in the exhaust pipe. Likewise, Nakase et al. gives no mention of how to modify unobstructed flow upstream of a discontinuity that generates noise. As such, neither reference recognizes the problems solved by Applicants, nor suggests the solutions claimed by Applicants.

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Regarding claims 8 and 24, Applicants object to the Examiner's assertion that Applicants' own specification supports the obviousness rejection. Applicants' own disclosure cannot be used to rectify deficiencies in the prior art, or to indicate that certain modifications are within the skill of the art. Nowhere does Applicants' specification indicate that one skilled in the art would be able to make the asserted modifications without reference to the application. As such, the rejection of claims 8 and 24 should be withdrawn.

Based on the foregoing comments, the above-identified application is believed to be in condition for allowance, and such allowance is courteously solicited. If any further amendment is necessary to advance prosecution and place this case in allowable condition, the Examiner is respectfully requested to contact the undersigned by fax or telephone at the number listed below.

Please charge any cost incurred in the filing of this Amendment, along with any other costs, to Deposit Account No.06-1510. If there are insufficient funds in this account, please charge the fees to Deposit Account No. 06-1505.


CERTIFICATE OF FACSIMILE

I hereby certify that this correspondence is being sent via facsimile to the U.S. Patent and Trademark Office at (571) 273-8300 on March 13, 2006.


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Respectfully submitted,

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